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Vernon Bailey.

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Left Washington at 4 P.M. on B & O for California via St. Louis & El Paso

The season has been unusually cold and late all over the country. A few early roses are beginning to blossom & the picnics have just opened out today. What is a few inches high & corn is coming up in a few fields but is not all planted. A few azaleas are still seen on cold slopes up toward Harpers Ferry.

Darkness came on before we reached Cumberland.

May 28 - A cold night over the mountains - I had to close the window over the screen. A man from Texas who got up early before we were down into Ohio says there was white frost along the way. I slept late and had breakfast as we came into Cincinnati. Here vegetation & crops are just as at Washington & no change was noticed to St. Louis except a little corn big enough to show the rows in southern Ill. St. Louis at dark.

May 29. Reached Kansas City at 7:30 A.M. Vegetation & crops not noticably different from that ~~of the whole~~ of yesterday.

Left Kansas City at 9:55 A.M. on Rock Island for El Paso.

To Topeka the country does not change much but the rich soiled bottom lands give a rich growth & the crops & vegetation not seen before. The rows of corn are slightly more conspicuous than usual but it is rarely 2 inches high. Wheat & oats are thrifty but low. Somewhat rye is headed out & a few fields of barley begin to show heads.

Pass at lots of good orchards and fine farm houses.

At McPherson the country grows very open & plains like but crops are still good and about the same for condition.

Lots of jack rabbits (L. melanotis) seen after passing McPherson, as many as 7 in one hollow near Pratt.

May 30 - Woke up at Tucumcari, and had breakfast before reaching Santa Rosa. Raining & ponds full of water. Vegetation very late grass short but thick, mesquite not leaved out, yucca plants not yet in flower but full of buds. Verbena, Eurthea & a few little yellow flowers in bloom. Gutierrezia getting green.

The town of Santa Rosa & over the ridge to Lourida & Torrance. Near Torrance they are yellow pine on the crests & north slopes of the mesas and little peaks on both sides of the RR and junipers & nut pine over the rest of the country except grassy flats & valleys. To the west the Gallinas Mts. are black with timber that seems to be yellow pine while still farther west the Chupedera Mesa is black with timber that seems also to be yellow pine. Southeast of Ancho the Sacaillos show considerable yellow pine along the tops and north slopes & nut pine & juniper on the sides. as does also Carrizozo Peak & range.

About 5-6 miles south of Carrizozo we strike the first Trans Pecos Larrea zone — abundance of Covillea tridentata and Prosopis glandulosa — The yuccas are becoming tall + more toward Tularosa with trunks 1 or 2 feet high. The mesquite is leaving out and a few flowers were seen on the creosote.

At & Tularosa + Alamogorda the vegitation is still backward, and grass has just started. There are almost no flowers, tho at Jirilla the tall Yucca radiosa are full of long spikes of buds and a few are almost in full flower.

Raining and cold nearly all day. Several men wearing overcoats at El Paso.

Left El Paso at about 5:30 and reached Deming just after dark. Conditions of vegitation the same. Mesquite in flower at Deming and a few Fouquieria near El Paso in bud but not yet in bloom.

May 31 - Left for Silver City at 10:30 & returned at 8 P.M. Got the things I could need from my camp outfit stored there and made arrangements to have my outfit kept over for another year.

A heavy frost ~~some~~ 2 weeks ago killed the leaves on the walnut trees at Silver, but a new crop of leaves have come out since. It also killed the leaves on the boxelders and killed all the fruit for this season, even to currants. Since the frost vegetation has come on very slowly and there is not much green to be seen yet and very few flowers. Grass is up big enough for good grazing and stock is thriving should late rains will insure abundance of grass this year.

It has been so cold that many of the winter birds are still waiting in the valley. Zonotrichias are singing in Silver City & Cowtopes sicalcoori are looping around here. Sayornis saya & Hirundo are nesting under the porches of the Depot hotel at Silver.

June 1 - The 8:30 train was 5 hours late and did not come till 2:30, so we tramped over valley and along dry bed of Rio Mimbres & got a full list of plants & birds & some mammal & reptile notes. The forest of Yucca radiosa is sending up great flower stalks that are like asparagus tips only 6 feet long and 2 or 3 inches through. The buds have not yet begun to spread and it will be some time before the flowers are out. The mesquite bushes bear a few old blossoms that seem to have been injured by the frost, but are also full of new buds. There are almost no flowers but a few warm days would bring them out in great variety & profusion. The ground is wet below the dry surface.

The Rio Mimbres is as usual a bed of dry sand, but there are many holes where coyotes have been digging down into the wet sand for water. I could not be sure whether they had got any.

The drift along the river has been picked up by ≠ men with teams but cones of yellow pine and Douglas spruce and pinetrees are common along the sandy bed. Also little walnuts, pieces of gum and bark of pines along the head of the river. There are ample evidences of fierce floods at long intervals, but the river bed is too sandy to hold water after the flood has swept by. The underground water is abundant & of excellent quality. Silver City is a forest of windmills and little ranches have started out over the valley in all directions.

The breeding season for birds is scarcely begun here in the valley. One nest with 2 eggs of mourning dove was found, Cactus wrens were building, as were tree swallows & says phoebe. The white necked ravens are scattered out & probably breeding in the yuccas & we found a family of downy burrowing owls in a hole in the river bank.

Started for Lordsburg at 2:30 and colored in zone maps as we went. Found nearly the whole set of Lower Sonoran zone plants continuous all the way in the valleys except on flats or basin bottoms where grass was the usual dominant vegetation. On dry mesas the Creosote, Mesquite, ephedra trifurcata?, Fouquieria gluticosa?, and Yucca baccata were the conspicuous species. At Lordsburg a more complete list of Lower Sonoran species was secured and the whole broad valley mapped as Lower Sonoran. Creosote bush is the dominant shrub over rimless dry mesas at Lordsburg & up several hundred feet above, even on gradual north slopes. It is even difficult to get many Upper Sonoran species for the north slopes of the Victorio & Pyramid mts., low, bare ranges with scarcely any vegetation. I merely left the north slopes blank as of probably Upper Sonoran zone climatic conditions

Lordsburg N. M.

Phrynosoma cornuta - One caught
" modesta? - ornatissimum?

June 2 - Got a horse + drove south about 9 miles to the Pyramid Mts. at base of Pyramid Peak, to see if there was any evidence of Upper Sonoran zone species & to look for Dipodomys + white sided jack rabbits. Found no trace of either animal, the Lepus texianus was abundant + I shot 3 + had time to skin only 2 of them. A good lot of big + plant rats were secured, but a few scrubby junipers near the tops of the peaks on north slopes were the only real upper Sonoran plants found. The upper slopes were very barren however + had better be colored for Upper Sonoran. The warm slopes of the mts. show even stronger Lower Sonoran elements than the valleys do. Fouquiera is abundant + thrifty, the big Echinocactus visligeni is common + a tall, long leaved Agave is scattered over many of the ridges. Several flocks of scaled quail were seen with young of various sizes from just out to big enough to fly a little.

In P.M. I took the train for Clifton, Arizona and continued N.W. through the same big, open Lower Sonoran Valley on a level with Lordsburg & Summit, then down 625 feet lower to the Gila River at Duncan, then down the river to Guthrie (200 feet lower), then over the 350 foot Ridges to Clifton on the San Francisco River at only 5 feet above the sea.

The whole trip was in Lower Sonoran zone, but along the sides I could in places get approximately the upper limits of the zone.

The change in crossing the Gila valley was less in change of species than in the more advanced condition of vegetation. Barley was ripe & the first crop of alfalfa had partly been cut & stacked, & garden vegetables were being harvested & corn stood over a foot high.

There are good farms & homes along the valley & Duncan is an attractive little town with green fields & big cottonwoods.

Clifton is a big, noisy, booming, banging, slamming mining town sitting along the bottom & side niches of the Frisco canyon for several miles. The mine mills & works are enormous & fill the canyon with a horrid din & vile sulphurous odors & pour down floods of thick gray, poisonous mud into the river. But for the town & mines the canyon would be ragged & wild & picturesque, with steep walls & huge cliffs, numberless caves & recesses & beautiful spots of green & shade in the bottom. The hills are eaten bare by the the few burrows of prospectors, but they probably never yielded much gold. I climbed about 500 ft up just back of town & on the north slope found only Garrya as a suggestion of Upper Sonoran. The south slopes are part Lower Sonoran to the top, but back 10 or 20 miles to the north I can see what seem to be yellow pines on the peaks.

June 3. Left Clifton at 7:20 AM. & with clear air & no wind got a better distant view. Clifton is, by the aneroid, only 75 feet higher than Guthrie, on the Gila, but over the ridges between we go ~~300~~ 360 feet higher than Guthrie. The Gila valley is luxuriant in plant & animal life and many parts are very attractive. Duncan is the center of agriculture & civilization, the abundance of water, shade, green fields and crops attracting numerous birds. There are some pleasant looking homes & people & enough of the Mexican and artificial element to add interest.

Up the dry wash from Duncan we got a good view of the Peloncia hills to the west & the glass shows quite a lot of Junipers along the cold slope. A few Junipers were also seen on the slopes down near the valley bottom below Duncan.

Reached Lordsburg at 10.45 and Hatchita at 1.45. By the aneroid Hachita

is 250 feet higher than Lordsburg but the country seems level all the way between. It just a continuation of the plain on which Lordsburg & Deming stand with practically the same set of Lower Sonoran plants all along. In places the valley is barren or merely grassy & on slopes that tilt to the north there is less evidence of Lower Sonoran while a south slope will usually be covered with Creosote & Mesquite etc.

The Big Hatchet Mts. to the south are so high and black with timber toward the tops that I feel safe in coloring blue along the crest of the range. But too far away recognize the timber with the glass.

West of Hachita we go through a low gap in the Little Hatchets with plenty of Lower Sonoran plants going through into the Valley de las Playas, which is a little higher & less purely Lower Sonoran than the valleys on either side. Then through the gap in

the Peloncillo Range a few gramma
cone down a cold slopes while
creosote goes through hot
slopes, then down about 300
feet into the big San Simon
valley which is again pure
Lower Sonoran desert & the
steep base of the Chiricahua
Mts. Much of the valley is barren
a grassy but in places
there is lots of Mesquite,
Creosote, Prosopis velutina,
Krameria, Ephedra, Zonaria
glutinosa? etc.
At the southern end of the valley we
rise up a long gradual slope
that soon loses all trace of lower
Sonoran species is mainly grassy
up & Chiricahua Station
and over the ridge & down to
Bernardino Station where abundance
of Mesquite & lower Sonoran plants
come in again. The San Bernardino
Valley to the south is a purely Lower Sonoran
basin that we strike only a corner of.
We next wind through a low pass that
carries a full set of lower Sonoran plants

around north of College Peak and down into the great Lower Sonoran Sulphur Springs Valley. A few of the big agaves are seen in the pass but we are soon down in the valley and at Douglas. at 3970 feet.

Douglas is a big smelting town out in the middle of the valley. I should guess it had 10000 inhabitants, well spaced. It has a good deal of street electric car lines

The valley is grassy but with no visible farming country except by the numerous windmills & tanks.

Mesquite is the dominant shrub of the valley but the whole set of Lower Sonoran species occur. They also extend over the low gap west of the valley to Bisby & Naco. A few big agaves & some Dasylirions occur in the gap.

Down in the valley at Naco it is pure Lower Sonoran again but the steep little range of

Mts. to the S.W. (the San Jose) show a growth of yellow pine along the crest + down well out in the highest cold slopes.

Then we came to the San Pedro river valley with its line of ramadas, meadows, + cottonwoods + the Huachuca Mts. block with timber along the east side. I can not make out the line between the junipers of the lower slopes + the yellow pines that show along the crest of the range, but the lower foothill plant of the valley seem to stop short of the wide fans that reach out from the canyons.

As we follow north down the San Pedro Valley the river bottoms become more heavily covered with mesquite and other shrubs and upon reaching Fairbanks the first Bolsachaius borealis appears + is then abundant + conspicuous all along the river flats to Benson, where with Suaeda suffruticosa Atriplex canescens + mesquite it forms a dense cover to much of the valley.

Reached Benson at 6:20 + hunted down by river till dark.

Benson, Ariz.

Citellus spilosoma heard
Amm-aspermophilus harrisi, Arnold miner says they are troublesome around his camp in the "Yellowstone Hills." just north of Dragoon Summit.
Citellus grammurus - Same old miner says there are gray rock squirrel there too.
Thomomys hills numerous both along river flats & on mesas
Lepus arizonae - common - a few seen.
Lepus texianus - Not common! one seen at Fairbanks.
Procyon trades comm. down river.
Lynx " " "

June 4 - In the clear morning light I could see no trace of tall pines on the Whetstone Mts just west of Benson, tho the upper slopes are dark with low timber, evidently nut pine & juniper. A few scrubby trees appear along the crest of "Yellowstone" Mts. just north of Dragoon summit and an old miner working in them says there is a fairly juniper & oak on the south slopes. The Dragoon Mts seem to have only nut pine juniper & oaks. On the crest of the southern end of the Santa Catalinas N.W. of Benson I can see tall timber that is evidently yellow pine.
The Sierra El Rivenos show only scattering junipers & nut pines over their barren slopes.
Not a giant cactus can be seen by sweeping the mesas on all sides with the glass, nor have any been seen thus far on the trip except one in a door yard here in Benson. The nearest I can hear of is about 30 miles west of here.
There are none of the Parkinsonias or characteristic Gila Valley plants here, but the climate seems very mild.

Left Benson at 4:30 and soon reached the divid, over which the Lower Sonoran plants pass freely. Then as we descend the first change is seen at Redington, where the densely spiny Cilyndriopuntia begins. Then just beyond Pantano a low, stout leaved yucca begins, and immediatly on passing Dreme the first Giant cactus were seen & soon were numerous on rocky slopes. Echinocereus wislizeni also became common and Palaverda (Parkinsonia microcarpa) suddenly became abundant. Many of the trees are full of beautiful yellow blossoms. The long leaved Agaves are also common.

To the south of the R.R. the country rises in high ridges between the Whetstone and Santa Rita Mts. and the north slope of this saddle seems to be wholly grassy & probably Upper Sonoran. It is probable however that Lower Sonoran plains go through on each side.

The Santa Rita Forest Reserve takes in lots of Lower Sonoran zone - What for?

Tucson

June 5. Got a horse and drove out to the Desert Laboratory & met D. MacDougal, Prof. Lloyd & Spaulding. Then rode & drove & hunted up Herbert Brown & then drove over to Rillito Creek below F. Lowell. Then came back to town & got a bicycle and took a bag of traps out near the Rillito Creek & set for Dipodomys deserti.

Found Yucca & Cactus full of blossoms & green fruit. Saw both yellow & red flowers on different plants of the True Opuntia said to be versicolor - but which I suspect to be two species, versicolor with yellow flowers & rubrotincta with red. Opuntia spinosa is also abundant but has the red (purple) flowers. It is loaded with fruit but has a few last flowers. All of the Cactus are full of nests of cactus wrens, thrashers & woodpeckers.

Herbert Brown took me over to the Court house where we found in the basement a few skins of wolves and mountain lions & hundreds of coyotes. The skins are turned in for bounty & then sold by the County treasurer. One tanned skin of a lobo was very brown, but not darker than a beautiful bior Canis mexicanis in the park. a yearling female caught when a puppy 75 miles S.W. of Tucson. W.H. H.Z. Vail, ~~town~~ treasurer at Tucson, who showed us the wolf & other skins says there are still many wolves on his ranch at the north end of the Santa Rita mts., east of Tucson. Mr. Brown also reports them seen at Helvitia and killed in the Babaquivori Mts.

June 6 - Got a bicycle and went out to traps. got 3 Dipodomys spectabilis, 2 baby kit foxes, and a Citellus tridecemlineatus. Will catch next train for Casa Grande to try for Dipodomys deserti there.

Train was over 3 hours late & we did not have Tucson until almost dark, so missed seeing the country. Reached Casa Grande late in evening and found a comfortable place to stay at the Woods Hotel, kept by Mrs. Shaw.

Casa Grande Station

June 7 - Took a long tramp over the valley near Casa Grande & saw lots of signs of Dipodomys deserti, and merriami, and saw 4 Lepus alleni, dozens of L. texensis & L. arizonae. Saw one coyote.

The valley is flat & level, & part of it has been irrigated from the Florence Reservoir, but the water supply gave out and most of the fields have dried up & been abandoned.

The soil of the valley is firm & rich and needs only water to make fine farms. This can be had when the San Carlos Reservoir is put in good condition.

The plants are few in species and colonial in distribution - For a long distance it will be all creosote, then all mesquite, then all Atriplex, then mainly Lycium & that is about the limit for the flat country. We found one giant cactus about 6 feet high, but the Neotomas had nearly killed it. Had eaten it full of holes and spiral burrows to near the top.

June 8. Casa Grande Station.

Caught 5 Dipodomys deserti & 2 sineglas & 1 Perognathus. Got a team and drove S. E about 5 miles to the nearest range of hills. to see if there was any trace of Upper Sonoran or of Dipodomys spectabilis but found neither. A forest of giant cactus encircles the base of the hills & a few reach to the top. Cover on rocky slopes & while Fouquiera & Polaroida go up all over the hills. Opuntia fulgida & versicolor & Echinocactus wislizeni are also abundant with the giant cactus, as are Fouquiera. There seems to be no trace of Upper Sonoran in these desert ranges, but they are all low. I should expect it in the Babiquivera hills, to the south.

The giant cactus is in flower & full of green fruit & nest hole of the Gila Woodpecker.

A heavy shower of rain & hail flooded the roads but missed us.

Cereus giganteus - encircles the foot hills of every range of hills from where first seen near Picacho, east of Tucson, the last point of mountains just before reaching Yuma. see myself. On many ranges it struggles up nearly to the tops and it reaches out over stony mesas, but rarely occurs in an open valley or on flat land. It is loaded with flowers & green fruit.

Opuntia spinosa - has almost the same range as the giant cactus around the base & the nets from there to the Mohawk hills. It is very abundant & very showy in pod of fruit and still has a few of its purple or crimson flowers. It usually pulp of fruit acidy

Opuntia versicolor - first recognized at Tucson where pale plants had yellow flowers & purple plants have crimson flowers Also around foothills at Casa Grande Station.

Casa Grande & Yuma

June 9. Could not get a team & wait to the reservoirs so took the belated train at 9 A.M. west.

The country grows dryer & barer - hotter westward to Yuma.

The mountains are all low & barren & usually black rock, often without visible signs of vegetation. Apparently they are all Lower Sonoran. The Maricopas & Mohawks are the highest but just as bare & hot & the tops as any. The only important features of the journey are the beginning & ending of open.

The soil conditions have a great influence on local distribution of plants and groups the species often sharply in to sockets of moist bottoms, dry bottoms, gravelly valley slopes, stony mesas, stony washes, hill slopes, rocky gulches, rocky mountain slopes. Certain species of plants reappear on each of these formations as it is crossed.

Echinocactus wislizeni – common from Tucson to Casa Grande, & the Maricopa & Mohawk Mts. Not seen farther west along S.P. Found mainly around the foothills but occasionally one is seen out on flat valley. In blossom at Casa Grande. One cut open & pounded into water which is wet but not good. Tastes like potato juice.

Holacantha – This thorny tree (Corona Christa of the Mexicans) was said to be found about 20 miles south of Casa Grande, but the first place we saw it was about 20 miles west of Casa Grande, in the bottom of the big open valley. It was abundant there and in all the valleys west to the Mohawk Mts. but no farther.

Parkinsonia microcarpa – Palo verde was first seen just west of Tucson, and was there common at Tucson, Casa Grande, and all the way to Yuma, & beyond in washes and along foothills, but not out on open valley. It grows among rocks to the tops of desert ranges. Some trees are in flower, others loaded with fruit & others bare of all but green bark.

_____ Iron tree – This lilac flowered tree (?) was first seen west of Mobila & thence all along to Yuma & the Salton Sea. It grows in washes mainly & is often loaded with its lilac colored flowers.

Prosopis glandulosa – From Benson to Tucson & Casa Grande & Maricopa mesquite is abundant and practically continuous. West of Maricopa it is found abundant in places and again not found on dry mesas for long distances. None was seen west of the Mohawk Mts. to Yuma, where ably pubescens was seen.

Prosopis pubescens – A few trees of screw beans were seen in the yard at Casa Grande and no more to be recognized until we reached the Gila & Colorado rivers valleys at Monitor & Yuma, where it is abundant. At Phoenix I think both species are together.

Acacia constricta - Common from Benson to Tucson. Not found at Casa Grande or west of there.

Mimosa poemiana? - This catclaw was found at Lordsburg & Duncan New Mex., and at Benson, Tucson, Casa Grande - west to the Mohawk Mts., Arizona, but no farther.

Fouquiera splendens - Common at Lordsburg N.M., at Benson, Ariz, and westward to Tucson, Casa Grande - all the way to Yuma & beyond on mesas & stony slopes.

Chilopsis saligna - Common along the Rillito Creek near Tucson, but not found west of there.

Other plants that range west to Tucson & no farther are:-

Opuntia engelmanii,
" " (many spined)
" (brown spined)
" leptocaulis
Agave fig
Yucca palmeri?
" radiosa
Koeberlinia spinosa
Ephedra trifurcata?

There seems to be a marked break in range of species just west of Tucson but it needs careful working out with camp outfit. It is evidently the change from Lower Sonoran to arid subtropical - or the "lower division" of Lower Sonoran.

The marginal distribution of giant cactus and palms (Washingtonia) around the sides of valleys would suggest that a taller belt than is found in the bottom of the valleys. A series of experiments would show whether this is the case and whether the giant cactus belt is frostless.

Yuma to Ludlo, Calif.

June 9. At Yuma the Colorado River is out of its banks and has flooded the bottom lands for miles on the west side. Cottonwoods, willows, screwbeans, + thickets of Baccharis stand knee deep in water & great lagoons are filled. But after gaining the mesa top the country is dry enough until we reach the Salton Sea near Mammoth. Then we follow the shore of the sea to Mecca on a new road that has been built around it. The old railroad runs through the sea + the line of telegraph poles go out until submerged at the east end & come out again at the west. At Mecca farming begins and the valley is largely cultivated up to Ludlo. There is a heavy growth of Atriplex, Suaeda, Baccharis, + mesquite where the land is not cultivated, but the sides of the valley are still sandy desert of the hottest + dryest.

Prosopis pubescens is abundant along the Colorado River at Yuma and reappears in abundance at Mecca & was seen at Coachella & Indio.

Prosopis glandulosa was not seen west of the Colorado until a few scattered and much dwarfed trees appeared west of Bertram & a few more west of Durand. At Indio it is abundant and large and it reaches along the valley to Coachilla, (Coachilla – valley of little shells). Here the pods are full grown and being eaten by Citellis tuscheandus.

Parkinsonia microcarpa – Palo Verde began on the mesa just west of Yuma & was common in washes until we reached the edge of the Salton Sea, then as we followed the shore, it was not seen again until near Mecca, where it is common.

_____ From this, this lilac colored flowered tree was common on the mesa west of the Colorado R. & there all along, (mainly in washes) thence all along to west of Salton, where the last were seen.

Indio

June 10 Got a horse + rode out to the foothills north of the town, but as I had only a few hours before train time I did not go far enough to get a view from Upper Sonoran zone. This would have taken a full day's trip back 15 miles to the crest of the mts., for there is only a trace of Upper Sonoran reaching down not over 1000 feet from the summit on the south slope. It is of course more extensive on the north slope. The trees along the crest of the range look with the glass like pinyons + nut pines.

Many of the Lower Sonoran desert bushes I could not recall or did not know the names of so I made a rough collection of specimens, wrapped up in papers.

The valley at Indio is fertile, part of it well watered, and in the town well shaded by trees - cottonwoods, palms, umbrella trees etc. Much alfalfa + fruit are raised. Grapes, watermelons + cantaloupes are being shipped

To Palm Springs

In P.M. took the train for Palm Springs station, merely a station house on the desert, & then drove over to Dr. William Murray's place at the real Palm Spring — a 6 mile drive across sandy desert with a fierce sand storm raging. Made part of the trip after dark but saw most of the desert plants seen in crossing the valley north of Indio. Saw also a big mound, a sand dune, covered with a desert willow in bloom. Could get only a dim view of the palms & other tropical trees at the Springs. Found Mr. & Mrs. Murray a very genial & very interesting old couple. Both are pretty old & feeble & it is hard for them to keep up their place.

Up San Jacinto Mts.

June 11 - Took a lunch, a canteen of water & an aneroid & started up the steep slope of the Mts. To run a zone line up the first ridge north of Tahquitz Canyon. Found it steep but easy climbing & pushed on steadily to a little above 4000 feet into the edge of Transition zone. Turned back at 4:30 but did not get down the slope before dark & had to make the last 1000 feet very cautiously by feeling. Got back at 9:30 with very weary legs.

The ridge runs mainly east & west and so gives good north and south slopes on opposite sides.

Lower Sonoran Zone extends up to about 3000 feet on the north slopes and 4000 feet on south slopes. It is characterized by a scattered growth of Covillea tridentata, Dalea glandulosa?, Dalea "macrocarpa", Kamerea canescens?, Mimosa roemeriana?, Ephedra antisyphilitica, Opuntia echinocarpa?, Opuntia crimson flower, Echinocactus wislizeni & ?ientii,

The slopes are steep & rocky & barren & hot.

Upper Sonoran zone begins on the north slope at 3000 feet and extends up to 6000, and on the south slope it begins and ends 1000 feet higher. It has much more vegetation + soil the lower slopes and toward its upper limit begines rather dense with chaparral. It is characterized by Juniperus monosperma, Pinus monophylla, Adenostoma sparcifolium, Arctostaphylos viscida? + pilula?, Ceanothus rigidus ? + mollis ?, Cercocarpus parvifolius, Quercus dumosa, Yucca whipplei, Schoenobirian, Prunus andersoni, Rhus ovata, Philadelphus and others that I collected but do not know. It had for birds Aphelocoma, Toxostoma, Pipilo megalonyx, and for mammals Eutamias merriami + Citellis fisheri. Deer tracks were numerous all through the zone, but the mountain sheep tracks seemed to be mainly below in Lower Sonoran. Thornomys hills were common throughout the zone, but I am in doubt as to the species. A few Geomys mounds were seen + lots of Perognathus houses among rocks + in trees.

Mammals - Palm Springs & San Jacinto Mts.

Ovis nelsoni - Common along the lower slopes of the San Jacintos. Trades + horns seen.

Odocoileus _____, Deer tracks are numerous throughout Upper Sonoran Zone in going up the Mts. from Palm Springs.

Citellus b. fisheri - Digger squirrels were seen at 3000 feet and heard at 5000 ft on slope of Mts.

Citellus tereticaudus - common in valley & and along base of Mts.

Ammospermophilus leucurus - Common in valley.

Eutamias merriami, Chipmunks were seen at 3000 and 5000 feet in Upper Sonoran Zone.

Neotoma _____ - Woodrat houses were common among rocks + in brushy places all through Upper Sonoran Zone.

Thomomys perpallidus - Gopher hills are common in the valley at Palm Springs.

Thomomys nigricans? - Gopher hills were occasionally seen throughout Upper Sonoran

Dipodomys deserti - Common in valley

Dipodomys similus - " "

Lepus _____ - Signs of cottontails on mts.

Sciopus _____ - Runways seen in Upper Sonoran

Transition Zone - begins on north slopes at 6,000 feet and on south slopes at about 7000, apparently. The I did not go above 6,200. Pinus coulteri was the first species reached, but only a few outlying trees from the main edge of tall timber was reached - consisting of Pinus coulteri, ponderosa, and Lambertiana. A few Abies concolor were seen on a steep slope. Quercus chrysolepis and another species of scaly barked oak began about 200 feet lower than the pines + I could not be sure whether they went with Transition or Upper Sonoran.

The line between Upper Sonoran + Transition agrees perfectly at this point with Hall's zone map of the San Jacintos.

Palm Springs to Los Angeles.

June 12, Very lame & sore & generally used up from 13 hours steady climbing up & down the hills yesterday, so I did not get out to do much. At 1 P.M. started back to Palm Spring Station against a fierce wind that cut our faces with driving sand & gravel. Took train to Los Angeles & arrived before dark, so saw the country all the way.

Arid Lower Sonoran zone stops rather abruptly at the little station half way between White Water & Banning, and no more Crosote bush, Atriplex, Dalea, Franseria, Ephedra or Echinocactus were seen. A few Chilopsis, Mimosa roemeriana?, and a new species of Cylindropuntia & the crimson flowered Opuntia reach a little further but most of them to Banning.

At Banning & west of there are good crops of fruit, grain, alfalfa, and vegetables, with or without irrigation, and such wild plants as Eschaltzia, wild oats, grass, weeds etc.

All the rest of the way to Los Angeles the country is largely under cultivation, with many extensive fields vineyards & orchards. Eucalyptus & pepper trees grow all along & in many places there are palms & pasture along great Orange groves loaded with ripe fruit.

Adwostoma fasciculata covers the hills down to edge of valleys and a profusion of vegetation covers all parts of the region.

Meadow larks were common west of Banning & flocks of blackbirds were seen in the meadows & grain fields. Grain is mostly ripe & much of it cut. Wheat, oats & barley are raised in abundance but largely cut for hay. It was raining just ahead of us & much had been wet & some had been spoiled by frequent rains.

Went to the Rosslyn Hotel, a fairly comfortable place.

Sacramento Los Angeles.

June 13 + 14 — Had much writing to catch up and gone wops to correct. Got mail & wrote letters and laid in supplies for next trip.

June 15, Went out to Pasadena to see Grinnell but found he had gone & the Mts. for the summer. Took Train to Oceanside in P.M. & then out to San Marcos where we arrived after dark.

June 16 & 17 - Remained at Twin Oaks over Sunday & Monday, so as to get a supply of cash from the Bank at Escondido. Got what notes I could but my baggage did not come, so I could do no collecting. Found the valley in flourishing condition with good crops and heavy growth of vegetation covering the whole country. Grain ripe & heavy and more wild oat hay than

can be used. Wheat, oats & barley have given a good crop on mesa land without irrigation. Alfalfa is good on the bottom lands.

Oranges, lemons & grapefruit & tangerines trees are loaded with fruit on the mesas & side slopes of the valleys both ripe fruit & the green sets for next years crop. Olives & English Walnuts show promise of a fair crop. Figs & loquats are bearing profusely. Date & fan palms thrive & many varieties of Eucalyptus are raised for wood. A Camphor tree grows at the Green ranch — Grevillias are abundant & full of flowers.

Zones —

The bottom of the San Marcos Valley is cold & frosty and evidently belongs to Upper Sonoran zone as do also the north slopes of ranges & the higher south slopes; but the sides of the valley, mesas & lower south slopes & the ridges are unquestionably Lower Sonoran.

The weather has been cool & delightful, with cold nights.

June 18.

Twin Oaks + San Marcos to Clear Lick.

Set out traps and hunted all the afternoon - Caught snakes + lizard + Horntoad. Followed a little way up the nearly dry San Luis Rey River + found alder + a few new cottonwood tree. So many of the species are new to me that I shall have to collect them.

June 19 - Caught Citellus beecheyi; Mustela pusilla, Perognathus boyli + fambeli, Reithrodontomys longicaudus, Microtus californicus + Thomomys b. pallescens. Lepus californicus are said to be here + L. audubonii is common. In evening I went to a rocky gulch + shot bats but saw only one and did not get a shot. Killed a barn owl + saw others.

Found a lot of the strange white Cotyledon pulverulentum growing on the walls of a canyon near here, on the hot slope only, while on the cold slope were the more abundant but less conspicuous Cotyledon edulis.

To San Luis Rey, Moosa & Twin Oaks

June 20, Got a team & drove up the San Luis Rey river valley as far as Gopher Canyon, up it to Moosa Canyon, up it to head & over into the Twin Oaks valley & back by Vista & down the Vista river.

Except in the San Marcos Valley found no evident trace of Lower Sonoran unless Eucalyptus, figs & olives indicate Lower Sonoran. No citrous ~~fruits~~ seen except in Twin Oaks valley when they do well. The low hills near the coast are mainly covered with wild oats but the hills further back are covered with dense Chaparral, Adenostoma, Ceanothus, Prunus ilicifolia, Hetteromeles the single leaved Rhus & Oak scrub. And still undivided as to Zone limits but am inclined to map all coast exposures as Upper Sonoran & valleys behind mountain ranges as Lower Sonoran. Still many species of Eucalyptis, figs, olives, & english walnuts do well & occasionally where given shelter of other trees or buildings.

To Escondido.

June 21, - Engaged a team for several days & drove to Escondido on my way to Santa Ysobel & the desert coast by that.

The valley at Escondido seems to be well sheltered from coast winds and the margins raise good oranges, olives, figs etc. The central part of the valley is mainly meadows, and is evidently cold and frosty & probably belongs to upper Sonoran. The Lower Sonoran belt covers the side slopes and runs up the mountains without much to mark its upper limit. but on south slopes may go to the top of the steep, sedge covered hills.

To Ramona

June 22 From Escondido I followed up a valley to the east & south & over a low divide into San Pasquel Valley. This is a wide flat valley with wet bottoms, willow & Baccharis plots & meadows and narrow lower Sonoran borders. The bottom is about 350 feet & raises mainly hay & grain & is upper Sonoran. All around the edges where most of the ranch houses are, eucalyptus groves are common - also olive, english walnut, apricot and a few orange groves. The orange trees are full of fruit & look healthy. Grevillia, Pepper trees, Umbrella trees, Fan & date palms & the big agaves are common in yards. Several Pomegranate trees were seen full of flowers. At the east end of the valley the Lower Sonoran apricot are more conspicuous and extensive apricot & olive orchards are seen. Also now oranges. Up the Canyon the Upper Sonoran chaparral begins on north slopes at 700 feet, with a dense growth of Adenostoma fasciculata, Cercocarpus parvifolius, Heteromeles, Ceanothus integerrimus?, C.

a Manzanita like bush with berries (
) Rhus (thick leaf) +
scrub oak (Quercus)

On south slopes Lower Sonoran goes to the top of ridges that seem 500 feet higher. It is marked by white + blue sage, Eriogonum fasciculatum, Hosackia glabra + in places by Opuntia englemani & by the absence of the previously mentioned Upper Sonoran species.

~~Near the head of the Canyon~~

A mixture of Upper + Lower Sonoran birds characterizes the valley, Pipilo, Plainsyptes, Nelsons Oriole, Mocking birds etc, with Aphelocoma, Melospiza +

Near the head of the canyon at 1300 feet large trees of Quercus agrifolia? + douglasii? are abundant. Then we cross open grassy fields over the summit at 1500 feet + down to Ramona in an open, mountain valley at 1400 feet.

Stopped at the Adams House for dinner + was surprised to find lemon + orange trees full of fruit in the yards, to see Cleo + Umbrella + Pepper trees flourishing

amid groves of old Eucalyptus, cypress, & pines. There are said to be some good orange groves on the sides of the valley here, tho the middle is too frosty for them.

From Ramona I go east up a crooked gulch then up & up & up to a summit at 2500 feet, then down a little & through a park like valley, then over a ridge & down to Witch Creek at 2800 feet. After leaving Ramona Valley it is upper Sonoran, chaparral all the way, with Adenostoma fasciculata, Arctostaphylos parvifolius, Heteromeles arbutifolia, Garryanus glauca, Ceanothus divaricatus, and up near 2500 feet a few bushes of a large arctostaphylos. Wild sage & Artemisia californica run over the top of ridge.

At Witch Creek there is rarely any snow or ice, but the summer is cool & the zone is upper Sonoran. Still a few fig trees are thrifty & bearing, so are english walnuts, pears, peaches, apricots, & apples. A small pomegranate tree is full of flowers. Grape vineyards are common but probably of hardy kinds.

To Santa Ysobel -

At Whitely Creek the chaparral is not so dense or continuous & the big, half rocky hills are covered with wild oats & scattered live oaks. Not past the east & south east are pine covered ridges.

June 23 - A cool night - said to be frost which I doubt, but I slept cold with all the blankets over me I could get.

Continued east over a ridge at 3100 ft & down to Santa Ysobel in a big open valley at 3000. The only farming in this valley seems to be grain & hay. Wild oats cover all the hills & uncultivated land. The valley is widely straight upper Sonoran, the Adenostoma plavisecta grows abundantly on the arroyos, willows & live oaks along the creeks.

Along the top of the Volcan Mts. just east of the valley, pines, of which I could make out the long arms of Coulter pines, grow all along the crest and of course on the east side. In going over the saddle north of this valley Quercus Californicus was first seen & it then common. Atocaris, Sturnella & Sturnianus are common in the valley.

Warner Valley –

Baseanus: _____ – Two long red racers with black heads ran into a gopher hole beside the road. I waited & tried one as he put his head out & found a large horntoad in him.

Phrynosoma blainvillei – The only horntoad seen was taken from a Baseanus shot on the way down into Warner Valley.

Sceloporus biserratus – The little scaly lizards are common on rocks & trees.

Cnemidophorus stejnegeri – One was seen & shot at but not secured at the edge of the valley.

To Warner Valley.

Crossed the divide at 3400 feet and down into Warner Valley to 2700, then across the wide, sandy, open valley to Warners ranch & up a side valley to the S.E. to Buena Vista, store & road ranch & put up for the night.

Found about 100 Indians & Mexicans gathered for a horse race & mounte game at the ranch, a rather interesting crowd, men & women betting on the races & joining in the mounte game. Just a country Sunday gathering for the only amusement the people have.

Warner Valley is apparently an upper Sonoran valley, the bare of any glove making vegetation. Grass, filaree, turkey mullen & a low fuzzy like shrub are the valley cover. A few willows & cottonwoods & elder bushes grow along the streams and the chaparral begins well up on the foot hills all around the valley. The chaparral is made up of Adenostoma fasciculata, Adenostoma 49
Ceanothus divaricatus, & cuneatus, Arctostaphylos parvifolius, Prunus ilicifolia, & scrub oak. Live oaks are are large & beautiful in groves or singly around the edge of valley.

Warner Valley

Citellus tereticaudus. common in & around valley.
Thomomys ______ abundant all over the valley.

~~Dipodomys~~ Perodipus ______ , numerous in the sandy valley.

Lepus audubonii - Numerous in the chapparal. several seen, one taken.
Taxidea ______ - Badger holes were common over the valley, some fresh.

On the Mts. to the N.W. of the valley forests of pine come down half way on the cold slopes and pines show along the crests of the mts. to the east & Northeast. Coniferous timber comes down at least 1000 feet below the summit of the Volcan Mts. just south of the valley

June 24,

Caught a ~~Dipodomys~~ Perodipus , a Microtus californicus, 2 Peromyscus bigger & browner than boylii + 2 gambeli, Shot a pair of the redwing blackbirds breeding in the tule patches around the springs.

Hitched up + started early, following up the eastern arm of the valley & the divide towards San Felipe Valley. Was surprised to find Artemisia tridentata common in this corner of the valley, also Opuntia (like small engelmanii) & the arborescent yellow flowered Cylindropuntia (echinocarpa?), evident overlappings from the desert.

Crossed the divide at 3450 + descend rapidly into the San Felipe valley. At about 2700 feet began to strike traces of Lower Sonoran in Prosopis glandulosa + Mimosa roemeriana, Chilopsis + Opuntia b. ramosa

San Felipe Valley

Citellus beecheyi common

Citellus tereticaudus, Only seen.

Ammospermophilus leucurus, common many seen but now scarce.

Neotoma _____, housed common both in rocks + in bushes + cactus.

Lepus arizonae? Cottontails are very numerous. I shot 3 + saw at least 1 dozen. They were mostly among the rocks.

Lepus texensis diserticola, abundant four shot + dozens seen. Found among mesquite + cassia bushes.

Thomomys hills are numerous.

Microtus Californicus - Signs seen along creek.

Dipodomys agilis? Holes + trails of a kangaroo rat of this size + habits of agilis were numerous.

Canis _____ - A coyote skull was picked up.

Procyon _____ - A whole scat was seen at Banner in the Canyon.

San Felipe Valley

The whole San Felipe valley below the 2600 foot contour and up to at least 3000 on hot slopes east of valley should be mapped for Lower Sonoran. Abundance of Mesquite (P. glandulosa) covers the whole valley and at the eastern end below the 2400 foot contour, Creosote bush is abundant. Other desert Lower Sonoran shrubs are Hymenoclea roseriana, Lycium andersoni? + "spinosa", Ephedra, Thamnosma, Calliogine, Atriplex polycarpa?, + canescens, Cordalia?, Opuntia englemani + echinocarpa?, Encelia englemani, 3 or 4 composite shrubs + Baccharis borealis.

The lower end of the valley opens out + down onto the desert + Salton Sea.

Upper Sonoran zone comes down to the edge of the valley on the west + south. On the west it is mountain chaparral, on the south + east desert species such as Juniperus monosperma, Yucca mohavensis? Agave (medina), mixed with the mountain species. Junipers cover the north slopes + crests

of the barren desert ranges east & south of the valley.

The main mountain slope west of the valley is densely covered with chaparral nearly to the top, & up to the pines & firs that crown the top & north slopes down the canyons 1000 feet or so. This chaparral is especially dense all along the road from Banner & the summit of the range near Julien & from 2600 to 4100 feet. It is composed of Adenostoma fasciculata, Ceanothus divericatus, - (spiny kind) and (with soft leaf), & Prunus ilicifolia, Heteromeles, Rhus (big kind) Arctostaphylos patula?, Cercocarpus parvifolia, Ribes cereum (common), Ceris , Arctomecon (yellow), Lonicera (white) Yucca whipplei, much Quercus dumosa, & many less conspicuous plants. In the gulches down at Banner, Populus fremonti, Platinus, Alnus, Salix nigra, Sambucus glauca, Vitis, Quercus agrifolia & englemanni are abundant.

Eutamias merriami, heard a chipmunk first at the top of the Banner grade & a couple of miles east of Julian. A miner at Banner told me there were chipmunks up in the pines.

Citellus beecheyi - One seen just below Julian & others a little lower.

Thomomys ~~Microtus~~ hills in common all over the ruts,

Near the top of the ridge Quercus californicus & Chrysolepis begins at 4000 ft just below the Pinus coulteri are next. The chaparral ~~occurs~~ near the summit & open pine & oak woods cover the top of the ridge. The big ~~green leaved~~ ~~scrub~~ ~~brush~~ Ceanothus begins on the west slope in scattered bunches.

Reached Julian in time for supper, tho I stopped 2 hours at Banner & fed my horses & skis & cottontails. Could see no other pine than coulteri.

June 25.

Had to stop & get 3 shoes put on my horses, then after going a mile or two one of the bars of the pole broke & I had to tie it up & return & have it welded, so did not finally get off until after 10. Came SW. from Julian, keeping near 4000 ft for 6 or 8 miles through half open, black oak & coulter pine forests. Tongues of upper Sonoran chaparral come up on hot slopes but most of the country above 4000 is Transition Zone. It is open

+ grassy + characterized as much by absence of chaparral as by its zone marking species. Besides Pinus coulteri + Quercus californica they are scattered bunches of a big smooth berried Arctostaphylos, Rhamnus californicus, Symphoricarpos orophilus, Wyethia with woolly leaves the size of my hand, a woolly leafed Thermopsis, a big pink purple lupine, wild roses and in shady places patches of Pteris.

The little farms are mainly meadow with orchards of thrifty apple trees full of young fruit + some potato + corn patches. The Wyola valley, just west of Julian is famous for its cherries, both in abundance + quality.

The road began to go down a long grade into the San Diego River Canyon + for about 2000 feet was in slopes Sonoran chaparral of the standard species, largely Adenostoma + Ceanothus + scrub oak, but with Rhus, Hetteromeles, Prunus ilicifolia,

Rhus trilobata & the (Rhus lanceata) entire leafed kind & many others. Scattered live oak, Quercus agrifolia & dumosa, are the principal timber.

Just below the falls, at about 2000 ft the chaparral ceases on hot slopes & is replaced by Hosackia glabra, white sage & herbaceous plants. At the bottom of the canyon at 1000 ft upper Sonoran chaparral comes down on cold slopes but the hot slopes are more open & barren with a few lower Sonoran species of plants.

Ulmaria occidentalis is abundant along this part of the canyon on the hottest slopes, but there are no oaks & not many lower Sonoran plants.

Along the river an abundance of Populus fremonti, Sycamore, Alnus, Salix nigra & a yellow willow & in places Baccharis viscalis & a fine broad species. Elder berry bushes are full of berries that are here getting ripe & hundreds of Plamopeplas are feeding on them.

To Lakeside.

The Indians raise a little wheat & barley & squashes & corn but nothing to wash a Zone. The beaches & mesas would doubtless raise good oranges & other Lower Sonoran products. The soil is good & there is plenty of water at present in the San Diego River besides that in the large flume bordering the valley. The great abundance of elderberries, now ripening, may have attracted the Indians as well as the Planipeplos to this valley. After turning west the valley is narrow & canyon like & the sides are covered with chaparral. The moist ocean winds come through it & evidently cool it to the an Upper Sonoran temperature, while the valley above is cut off from this wind. About 5 miles up I reach Lakeside. The valley opens out with wide bottoms & some ranches. Around the slightly elevated margin of the valley the Eucalyptis, pepper trees, & orange groves would indicate Lower Sonoran Zone. Even at Lakeside, near the lake & flat

Lakeside

the eucalyptus, Washingtonia palm, Pepper trees, umbrella trees, Oleanders & the Agave grow to perfection while along the stages to the south & west are splendid & beautiful groves of Orange & Olives, of old, healthy, bearing trees. The whole valley except the damp bottom lands is occupied by Lower Sonoran. It is sheltered from the ocean winds by the mountains & the west, is rather dry & hot.

June 24. Got an early start from Lakeside & driving due west out 5 miles, turned north & followed up Cajon Cr. a few miles, then over the ridges by a new & easy grade to the Summit & down into Cajon Valley, then over a low ridge & down to the Bernardino River & then slightly up & over to Escondido.

The sides of the valley west of Lakeside & of Cajon Creek valley are Lower Sonoran, with little to mark them except absence of most of the species of Upper Sonoran chaparral, and its place filled by Opuntia englemani, white sage,

Lobrisa + Poway Valleys.

Hosackia glabra, wild oats + small plants, turkey mullen, a slender Orobus, and others. The introduced species such as Orange, Eucalyptus, pepper trees, olives, big Agaves, Grapes Washingtonia palms, umbrella trees, & the Oleander certainly indicate Lower Sonoran zone.

A peculiar feature in zone distribution here is that Lower Sonoran runs highest on S. E. slopes, the slope sheltered from cool ocean winds and exposed to the hot sun.

In the bottom of the San Diego River valley there are 3 species of Baccharis or Bacharis like shrubs, many willows + especially the narrow leaved S. nigra or forma of it, some sycamores and numerous cottonwoods, (P. fremontii). It is doubtful if the bottom of the valley can be considered Lower Sonoran or at least the moist part of it.

Poway Valley lacks most of the Upper Sonoran species & clapped over its warm slopes and has Eucalyptus groves, Grevillea trees, Pepper trees + the big Agave rotundata.

Bernardo Valley
to
Escondido

Then over a low ridge to Bernardo Valley. The warm slopes & sides of the valleys are all Lower Sonoran, open & both wet and dry, well sheltered by mountains to the west. Eucalyptus & pepper trees were all I could see of Lower Sonoran growth except on much neglected but fairly good Orange grove.

Then here over to Escondido the Lower Sonoran open slopes seem to be continuous on the south east slopes at least.

Coming into the valley at Escondido from a new direction seems to add more evidence of its Lower Sonoran affinities. Orange & grapefruit & Lemon groves are more numerous & extensive than I thought & many other trees and plants, palms, agaves, & such are abundant.

Reached Twin Oaks at 6 P.M. & staid over night.

Oceanside

June 27 Drove to Oceanside, & got mail including Wiesters bulletin mss. to be gone over, a two days job.
With this & reports & express account, packing specimens & writing letters I could not get off until July 2.

July 2 - Oceanside to San Diego.

Santa Ana to San Francisco

July 4 - Got up at 5:30 at Santa Ana & reached Los Angeles at 7. Left for San Francisco by Coast line S.P. for San Francisco.

From Santa Ana to Los Angeles is level, fertile, highly cultivated valley country or extensive hay & grain fields. Great orange groves of beautiful trees loaded with fruit (part of them) are seen in many places, English walnut groves are numerous, healthy & full of fruit. Vineyards, peach & apricot orchards are common. Eucalyptus groves & rows of palms & pepper trees are seen all along. There is no chaparral - The whole valley is intensely Lower Sonoran with no marked trace of upper.

Leaving Los Angeles we follow up the river valley to Tropico & Burbank & Tolucca, Chatsworth; a wide, flat valley, evidently rather dry, often sandy & desert like with much cactus (O. engelmanni? & echinocarpa?), with white sage & Hosackia glabra & several forms of Baccharis & the composite shrubs

& now weeds (mustard, radish, Scotch thistle, etc) from native plants. An occasional bush of cleveuse grows on banks & elder along bottoms.

Vineyards are numerous & extensive there are large olive & Walnut orchards some orange groves. Lots of Eucalyptus rows of palms & pepper trees and great fields of grain (wheat, oats & barley) towards Chatsworth. The soil is brick & now grain & pasture & hay are raised in the valley, but now olives, apricots, & orchards along the foothills.

The mountains north & south of Burbank are covered with chaparral, in places live chemise & scattered oaks & Rhus & kettleweeds.

While the valley is extensive lower Sonoran the Mts. are intricately dashed with Lower & Upper according to exposure & elevation.

After passing Chatsworth we go through a long tunnel under a rocky ridge & come out into another valley at Santa Susana, where abundance of Queenes Lotota was first seen. This valley is mostly open & bare of

& chaparral. Grain, olives, Eucalyptus, apricots, alfalfa & beans are the main products. Even the hills are covered with sage, Hasockia, Artemisia Californica, & a few Quercus agrifolia & could be cropped as Lower Lagoran.
Only the distant ranges north & south show dense chaparral of upper zones.
Continuing westward down open valleys the country is similar but more fertile & better cultivated as Oxnard.
Besids grain & occasional orchards there are extensive fields of beans & between Santa Clara & Oxnard thousands of acres of sugar beets - Also much alfalfa & numerous groves of large eucalyptus.
The mountains have disappeared on the South but are high far to the north.
A cool breeze comes in from the coast & vegetation takes on a ~~xxx~~ fresher & greener appearance -
Oxnard is a ~~xxx~~ town of small homes full of trees, Eucalyptus, Pepper.
We soon ~~Pass~~ the river & go through more & bigger fields of sugar beets & beans, before reaching the coast at Ventura.

West of Ventura the road is cut into sea bluffs that are steep & cool & chaparral covered & seems to be upper Sonora.
Then asphalt & oil works are passed & a little after reaching Santa Barbara the coast flattens out for a space & the chaparral is less & some crops & trees are raised. At Santa Barbara there are abundance of Eucalyptus, pepper trees, figs, olives, a few orange trees in yards, rows of fan & date like palms, the yuccas, Medeiana glauca, clanthus, a few rubber & magnolia trees, orange, loquats.

Tall trees appear above the black chaparral slopes of the Santa Ynez Mts. to the north. Just a few along the creeks.
West to Point Conception this narrow strip of semi arid Lower Sonoran continues, each little point & cross ridge serving to cut off the cool west wind. Little towns & settlements are scattered along but grains are the principal crops & there is little to mark Lower Sonoran except above of Upper Sonoran chaparral.

Artemisia californicum obv.
Ambrosia "
Baccharis "douglasii" "
Lupinus (shrubby blue) "
Sedum edulis? "
Eriogonum fasciculatum "prostratum" "
Samphire? "
Blue sage "

At Point Conception, or more markedly at Arguello point, the surface changes to high, rocky shore & steep cliffs, & the vegetation to a dense cover of low wind beaten shrubs & plants as noted on the opposite page.

Big Sur comes rolling in the coast in picturesque & attractive. The air is much cooler. Further inland to the east, up the Santa Ynez & Jesus Maria valleys I can see yellow slopes that suggest big tracts of open valleys, skirted up by pines & sheltering hills. But the coast strip continues, what I assume to be upper Sonoran to where we leave the coast & follow up the river valley & beyond as far as I can see up the coast.

As soon as we get back behind the first row of hills from the coast all shrubs cease & there is only wild oats & a few scattered rather scrubby Quercus agrifolia - grain & beans are the only crops until we come down into the big valley of Sta. Maria. This valley is deeply open to the coast

and while the western edge of it along the railroad is tinged with chaparral & raises mainly sugar beets, potatoes & barley the eastern & greater part are yellow with grain & stubble & wild oats & dotted with live oaks, eucalyptus groves & orchards of some kind. A few scrubby fan palms & pepper trees suggest that farther inside the valley should be wooded & lower Sonoran. Yellow oat covered hills east of the valley also support this view.

Along Arroyo Grande, near Oceano, are extensive marshes, of reeds & willows & some tules & cat tails, full of birds, mainly blackbirds. A few small fan palms & fine groves of eucalyptus grow at Oceano, but the coast chaparral, as noted on last page with Rhus, Ceanothus & willows added predominates to Grover as we follow the coast. At Grover we go up a narrow Willow & Sycamore gulch, with some live oaks & wild oat slopes & some chaparral slopes, a mixture of zones.

San Luis Obispo

At Edna where a small little inland valley opens up, well sheltered from the sea winds by a small little range of hills. The valley plains are mainly live oaks & wild oats dense slopes & chaparral on some of the hills to the west & here & there a patch of wheat. Grain & beans are the principal crops but eucalyptus groves are common as well as pine & cypress around the houses. At the far end of this valley San Luis Obispo lies in between the hills. In the town are small palms (fan & date like), pepper trees, olive, fig & peach, english walnut, apricot, a few good thrifty orange trees, grapes, & lots of eucalyptus, pine, sycamore & live oak.

Barley, oats & wheat are the principal crops raised here now.

From San Luis Obispo we climb rapidly to the crest of the coast range over high slopes of wild oats on south & east & chaparral on unpeopled west slopes. There are live oaks & sycamores with the wild oats and the chaparral is Artemisia californica, Ditterosmia, blue sage, adenostoma,

Over Mts. to Santa Margarita

Eriogonum fasciculatum, yucca whipplei, Ceanothus & many other shrubs I could not be sure of.

Fire is running over the mountain sides & miles of wild oats & some chapparal are burned & burning. After going through many tunnels we go through a long one & come out in a high mountain valley with dense chapparal around the sides & lots of Pinus sabiniana (if I know it). The sheltered slopes of this valley are open, wild oat pastures, full of big Quercus lobata & agrifolia!

We now go down to the north about 4 miles from tunnel to Santa Margarita (985 feet). Cottonwood, willows & Sycamores along stream. Q. lobata & agrifolia along bottom, Pinus sabiniana & chapparal along sides of valley. Oat hay is the only crop. Next come big fields of potatoes, alfalfa, & garden vegetables, small orchards. Poor farming. At Templeton a good olive orchard & broad valley full of Q. lobata suggest cows Eminency

A few neglected orange trees in a weedy yard cling to existance.
No more Pines in sight. At San Miguel a few pepper trees are seen but there is very little farming & that is of the worst kind. All orchards are full of grass & weeds & most are dying. Cattle & hay are the chief industry. Still the lower Sonoran part of the valley widens & great parks or rolling mesas are all wild oats & big oaks.
To Kings City & an hour beyond when it got dark, the valley is similar, thinly settled, mainly hay & grazing. The little farming is poor & carelessly done. Upper Sonoran chaparral covers the hangs & the peaks with toy pines often showing along the crests of the higher ridges. We run so close under the foothills on the east as to ride all night except now & then a glimpse.

San Francisco to Capistrano

July 5. Got into San Francisco about 2 A.M. but went to bed & slept till morning on the train.
Found Dr. Merriam and used most of 3 days in laying plans for the summers work.

July 7. Started south at 5 P.M., tried to go by the Valley route to Los Angeles but every berth was taken on the night train so I had to go back by the Coast line.
Went from Oakland to San Jose when I caught the down train & in this way saw the Bay of country east of the bay.

July 8 — Got into Los Angeles afternoon & too late to get a train out so remained & hunted up botanists & maps

July 9. Went down to Capistrano got out my baggage & set a line of traps

Capistrano.

July 9 & 14 - Trapping & collecting at Capistrano -

July 15 - Drove up Trabuco Canyon into the Santa Ana Mts. to 2300 feet. Entered the mountain canyon at 1300 feet where upper Sonoran species covered north slopes & followed up beautiful wooded creek bottom about 5 or 6 miles to near end of wagon road - to the first grove of Pseudotsuga macrocarpa at 2300 feet. There were other scattering trees & groves of it higher up, but no amount of timber anywhere in sight on the mts. We could see 3 small groves of pines along the crest of the range & Forest Ranger Robbins said it was coulter pine, as it looked to be. He said there were no other pines on the mts. but reported a white oak (probably engelmani) higher up and the golden cup oak (chrysolepis) and said there were a few california laurel (umbellularia) in the canyon. No thimbleberries on some junipers on dry Hot Spring, but is not plentiful here. For lists of chaparral see rock book.

July 18. To Santa Ana.

July 20 - Drove up Santiago canyon to mouth of Silverado Canyon about 1000 ft and some 15 miles east of Santa Ana. Drove through miles of beautiful bearing Orange & Lemon groves with occasional eucalyptus trees along the roads to furnish fire wood for the ranches. The whole valley to Orange & beyond & to the foot hills is laid off in squares of trees and fruit trees.
There are numerous fields of english walnuts, some grapes and out on the foothills olive orchards.
Palms, of many kinds, and pepper trees are numerous and pomegranits, loquats, pears & apricots are passed.
Over the valley there is already a native plant left, but Encelia californica, Croton californicus, Malva elegans, Grendelia & other weeds fill the waste places. Along the foothills cactus is abundant, mainly the 3 kinds of prickly pear and a few O. basilaris. Hosackia glabra, Artemisia californica & Eriogonum fasciculatum & white sage (Romania stachyoides) grow on the foothills

In the low, open part of Santiago Canyon there are abundance of sycamores, willows, Baccharis viminea, and live oaks (agrifolia). At 1000 feet on the canyon slopes, or at least the cold slopes, the real chaparral begins in Rhus laurina + ovata + Trilobata, Rhamnus crocea + Californica + tomentella, Cercocarpus parvifolius, Quercus dumosa, Adenostoma fasciculata etc.

From here the hills are densely covered with chaparral to the tops, with only 2 small patches of douglas spruce (macrocarpa) on cold slopes near the summits as shown by field glass.

There is no paving in the canyon. The lower part is held as a park for Santa Ana + is full of campers. Above are some mines in Silverado canyon + loads of ore were met. The canyon is open for a long distance + beautiful + clean with big sycamores + live oaks. A good stream comes down through it.

On the return trip we drove around through Orange to Santa Ana.

A Woman living on a ranch 7 miles south of Santa Ana and somewhat higher up on the foothills says she has kept tomato and chile plants over winter for four years before they were killed by frost. As they are killed by the slightest frost this is a significant fact.

She also says sweet potatoes & peanuts are extensively raised on the dry, unirrigated uplands, also beans, lima, navy & blackeyed. We saw miles of beanfields

June 21. Santa Ana to Newport.

Sunday afternoon after finishing report & maps & plant lists we took team down to Newport on the coast. After passing the fruit ranches we came through great fields of beans and grain, wheat, oats, barley & corn, then over wild oat and grass land to the shore. There are some marshes & ponds by the way & a lot of little washes & some slits at the ponds. The soil is sandy toward the shore & all tracked up with Perodipus & other kitty tracks.

There is little vegetation of native species, but turkey mullen, wodia & grindelia suggest Lower Sonoran. Opuntia occidentalis grows on the sides of gulches near the coast. The usual beach plants are there.

The San Joaquin hills to the south are covered with mainly wild oats & mustard, but patches of low chaparral appear to be of Artimisia californica & Eriophyllum fasciculatum, neither of which we took a Zone.

To Corona.

July 22. Left Santa Ana on 11:45 train for Corona. Passed through the same kind of orange, lemon, & walnut farms to Olive. Then after crossing the Santa Ana River came into a desert strip of cactus, sand & waste land. It is old river flats, stony & sandy — poor soil but rich in animal life. The sand is all tracked up with small things — Perodipus etc — & would probably yield several desert species. It could be worked from the little town of Olive by walking a mile north.

We then follow up the Santa Ana River through the canyon to Corona, with Lower Sonoran plants all along the valley including cactus, Eremocarpus setigera, Baccharis viminea etc.

Upper Sonoran Chaparral comes down near the valley edge on slopes south of the river and covers the Santa Ana hills densely to the tops. Half a dozen little patches of big cone Pseudotsuga appear in the upper ends of N. E. canyons above 2000 feet. Most of the trees seem small.

The hills north of the Santa Ana R. are generally low & bare of even chaparral. Patches of Artemisia californica & Eriogonum fasciculatum cover some of the upper slopes but have little zonal significance. From Corona the higher cold slopes have a suggestion of some heavier chaparral, but most of these hills may be considered Lower Sonoran.

The country about Corona is hotter and dryer Lower Sonoran than about Santa Ana. Oranges, lemons, grapefruit, olives & pomegranates are the principal crops back to the foothills — to about 1200 feet.

In the afternoon we drove up the canyon south of Corona, up into the dense Upper Sonoran chaparral of Rhus laurina & ovata, Ceanothus crassifolius, Cercocarpus, Quercus dumosa, Rhamnus californica, tomentella, & crocea, Adenostoma fasciculata etc. Could see several small groves of douglas spruce (Pseudotsuga) on N.E. slopes far above, but the heavy chaparral runs to the top of the range.

To Coldwater Canyon.

July 23 Drove from Corona about 10 miles south to Temescal and up into the mouth of Coldwater Canyon and stopped at the Glen Ivy hotel. This is at 1400 feet at the mouth of the canyon and lower edge of chaparral. The mts rise steep & bushy back of the house. The canyon cuts in narrow & steep sided & a tangle of trees, bushes & vines. A fine cold, clear creek comes out of the canyon & is at once harnessed in pipes & flumes & set to work in orange & lemon groves - from here to Corona and then furnishes part of the water supply for the town of Corona.

A hot sulphur spring also comes out just below the mouth of the canyon & is used for a big bath house near the hotel.

The valley is semi-arid with lots of cactus & some scattered chaparral & live oaks. There are grain fields and down along Temescal Cr. some alfalfa fields and on the benches a few orange & lemon groves. At Glen Ivy Hotel there is a good bearing orange grove of several acres & lots of fine large fan palms.

The Canyon is narrow & brushy & full of live oaks, sycamores, alders, willows & farther up maple & some Pseudotsuga macrocarpa. The chaparral covers the north slopes densely & the south slopes sparingly to the mountain tops.
The conspicuous species are Rhus laurina, ovata, diversiloba, & trilobata, Rhamnus californica, tomentella, ilicifolia (and crocea in the valley), Ceanothus.
Cercocarpus parvifolius, Adenostoma fasciculatum, Arctostaphylos , ~~Ramona~~ polystachia & stachyoides, Artemisia californica, Eriogonum fasciculatum, Yucca whipplei etc. It is so dense that travelling off the trails is almost impassible, and the only trail does not go far up the canyon. Even on it the grapevines & poison ivy make a tangle difficult to penetrate.
Mammals are scarce in the canyon except Neotoma & 3 species of Peromyscus, raccoons & gray foxes. There are no signs of Thomomys in the canyon & only Microtus californicus at the lower end.

Just below the level the valley is dry + sandy and Parodipus and the cactus wood rat + Thomomys pallescens are abundant, also Lepus auduboni
All of the Lower Sonoran plants of the interior valley country are common - Cactus, Baccharis viminea + the leafless species, Eremocarpus setigerus + Croton Californica, Cucurbita foetidissima, Madia elegans, Eriogonum douglasii, + Bigelovia dumosa. Lower Sonoran runs up against the mountains + on steep south slopes keeps out the dense chaparral. Oranges + lemons + palms do well, even when the lower edge of chaparral is cleared out to make room for them.

The hills east of the valley look bare and brown, but are really covered with a tangle of white + blue sage, Eriogonum fasciculatum + Artemisia californica. There are scattered bunches of Rhus trilobata and a few other bushes in the gulches and a trace of heavier chaparral can be seen at the edges of cold slopes. All but the higher cold slopes of this low, rough plateau, a group of hills should be mapped as Lower Sonoran. It is apparently used for stock range + bee pasture.

Jemseal to Elsinore.

July 8th. Left Glen Ivy Hotel at 2 P.M. and drove to Elsinore, 14 miles south east and put up at the Elsinore Hotel.

Followed up a narrow and often rough valley from Jemseal to Elsinore valley with the Santa Ana hills. rising black & chaparral covered on the west and brown "sage" & "buckwheat" (Ramona & Artemisia & Eriogonum fasciculatum) covered hills on the east. More Douglas Spruce (Pseudotsuga) and coulter pine appear in the upper canyons than I have seen before and as usual the spruce comes down to about 2500 feet on cold slopes while the pine appears along the higher part of the range.

The bottom of the valley & the south slopes of hills to the east are Lower Sonoran with the same set of plants seen in the valley at Jemseal. Many bee ranches are seen in corners of the valley and some orange, lemon & olive groves along the foothills to the west.

July 27 48 Elsinore.

at Elsinore the valley is open, with low hills on the east & the Santa Ana Mts. rising abruptly from the west side of the lake. The lake is 3 miles wide & 7 long, and is said to have risen 20 feet in the last 2 years. but is still 8 feet below the overflow level.
Much of the shore is flat & grassy and is used for pasture or hay. There are few plants to indicate the zone, so I have mapped it as upper Sonoran.
Just back from the shore are abundance of Plucea borealis & Baccharis viminea, also a few Baccharis emoryi, some Opuntia occidentalis & bernardina - Eremocarpus setigerus & Croton californicus. On the evidence of these and absence of Upper Sonoran species I have mapped the valley & foothills as Lower Sonoran, including a foothill strip along the west side of the lake below the chaparral that is largely cultivated and occupied by Oranges, lemons & other groves.
In town pepper trees, Eucalyptus, Palms, Oranges, olives, acacias, and big agaves are common, but the crops out over the valley are mainly grain or hay

For the three mornings at Elsinore the fog covered the Santa Ana Hills & the base but soon lifted after 8 or 9 Oclock. It sometimes even hides the lake and the hills to the east. but the valley does not get much fog at this season. The winter climate is said to be delightful here.

The hills east of Elsinore are the same as noted before and are probably Lower Sonoran.

The sulphur springs & hot baths at Elsinore are the great attraction & in winter the climate is said to be fine & the duck hunting good.

There are lots of ducks on the lake now, mainly cinnamon teal, some gadwall & a few wallards. One nest of a teal was found with 2 young & 4 eggs but no young ducks were seen on the lake. A few coots & dabchicks were seen and a flock of about 30 glossy ibises, some blue herons & a night heron lots of killdeers & several black necked stilts. These were evidently attracted to the lake in part by the swarms of lake flies breeding in the muddy margins.

Pocket gophers are numerous in the sandy shores of the lake but the pelt specimens caught do not show any marked local variation.

Elsinore to Hemet.

July 29 Left Elsinore at 7 A.M. and followed up a dry wash most of the way to Perris. The water has been taken out of the creek but stands in pools here & there. The hills are low & rough ordinarily places a mass of granitic boulders, but strips of flat land make farms here & there. The vegetation is mainly 'sages' — artemisia californica, Ramona polystachia, & stachyoides & Eriogonum fasciculatum. Two juniper trees were seen but no amount of upper Sonoran vegetation. At Perris Pepper trees, fan palms, eucalyptus, & fig Agaves are common, also Turkey mullein & tarweed, so I am inclined to call it Lower Sonoran.

A little east of Perris is an Atriplex flat & desert like valley. Then near Hemet fields of Abronia make seas of pink carpet over sandy fields where the grain was been cut. The land is generally sandy, and rather barren except when irrigated

To Idylwild

July 30. Took stage to Idylwild at 1:30 & reached there at 5:30 – 20 miles. Elevation is 1600 and Idylwild 5280 feet.

Lower Sonoran reaches to the foothills at 2000 feet on north slopes and up the slope opposite to about 2500

Upper Sonoran chaparral runs from these levels up to about 4500 feet on cold slopes and 5500 feet on hot slopes.

Transition zone begins in cold gulches at about 4500 feet with Pseudotsuga macrocarpa and coulteri pine and on more open slopes at 5000 feet with Pinus ponderosa & jeffreyi & coulteri, or at about 5500 feet on south slopes. It extends up to about 7700 on north and 8500 on south slopes.

Located at Idylwild in a tent under Pinus ponderosa & jeffreyi & Quercus californicus at 5300 feet

July 31. Took rest of day for making out expense account.

Idyllwild

Aug. 1 & 2 – Trapped up creek into canyon but caught little.

Aug. 3. Got a horse & started up San Jacinto peak. Climbed the main ridge to 8200 feet, then followed trail north east to creek valley at 7500 feet, then up it to 8500 feet on east side of Marion Mtn. and camped for the night. Set traps from 8500 to 9000 feet in canadian zone meadows. Slept with only a saddle blanket & bed & kept a little fire to keep warm

Aug. 4 Caught only Microtus & Peromyscus & a Sorex, but left part of traps as I went on over the ridge into Round Valley (Tamarack Valley) to the tent kept there by the hotel people during summer. This is at 9000 feet by beautiful Canadian zone meadows. Left my horse & climbed 1800 feet up to San Jacinto peak & back in 2 hr. A good trail goes to the top & a horse may be ridden to 100 feet of the top.

Found snow banks at 10000 feet and above in many places & top of peak Combed 5 snowbanks on cold slope of Jean Peak and rode over one bank of old snow lower down at 9500 feet. There are no meadows or wet places above 9300 feet and the higher slopes are very dry, bare granite gravel which prevents the possibility of many Hudsonian plants. Pinus murrayana & flexilis reach the peak but for the upper 500 feet are much dwarfed and often prostrate. Gnarled & twisted old trunks lie on the ground while the branches reach off from the wind.

The view from the peak is superb, reaching from the ocean to the desert beyond the Salton Sea, from the San Bernardino range to peaks near the Mexican boundary.

Returned to tent, set traps & got my supper & went to bed with plenty of blankets.

San Jacinto Mts.

Aug. 5. Caught 2 Thomomys, a Microtus & Sorex. Rode down the creek, North Fork of Tahquitz, about 2 miles to 8500 feet, or to edge of transition zone on the warm slope, then back by the same trail and over the ridge and down to Camp. Set traps in a meadow at 8000 feet for Thomomys & shrews

Aug. 6, Rode all day for working up specimens, writing notes and cleaning up from my trip.

Aug. 7, Returned to traps on ridge at 8000 feet and went to top of Tahquitz peak at 8826. Got a Thomomys & Sorex & one Peromyscus colored in more of the zone way.

Aug. 8. Shot a Eutamias merriami at 5500, this extreme upper limit, & set a few traps, Made up specimens & wrote up notes.

Aug. 9 + 10 - Caught a Merriam + went on reports.

Aug. 11 - Rode over to Hemet Reservoir + then south up the valley to near southern end, mapping zones on both sides as I went.
Found a big sagebrush valley about 10 miles long with lots of desert species, Amphispiza nevadensis, Chondestes, Ammospiza etc.
Also pack rabbit tracks + badger holes.
Rode about 30 miles on a hard gaited horse + am tired + sore.
At about 4:15 P.M. an earthquake shook the camp and sounded, but as I was paddling along on a horse back did not feel it. A rancher said it shook his house violently + he had telephoned to San Jacinto + learned that it had broken the windows in the bank there.

Aug. 12, Wrote reports & packed specimens

Aug. 13, Staged down to Hemet and got upper limits of the species noted in coming up the mountains. Corrected former maps & reports accordingly.

Aug. 14, Got a team and drove to Lakeview, and north around the end of San Jacinto lake and back along the east side of the lake and marshes. Found many species of water birds and waders and got good zone lists of plants. The desert species are conspicuous north east of the lake where they come down from San Gorgonio pass. A few mosquitos of both species were seen, also Chlorpais, Atriplex, Baccaris,

Cactus wrens were common & nests seen. Dipodomys, Perodipus & Perognathus tracks were numerous

Returned to Hemet & set a few traps before dark.

To Riverside

Aug 15. Took our P.M. train to Riverside and stopped at Glenwood Hotel. Visited Dr. Attwood in evening & learned much of the county & fauna.

Aug. 16. Mrs. Attwood took us out to the Wilder ranch 7 miles west of town but the wilders had gone to the nuts. Got good notes & mapped zones country. Took 1:30 train for Redlands & arrived at 4 P.M. Had to wait at San Bernardino for train.

Aug 17 Took stage for Bluff Lake camp in San Bernardino Mts. & followed up Santa Ana River valley about 10 miles (2700 ft) Then packed our load on horses & burros for about 5 miles up the canyon to fork of Bear Creek then took another old stage (at 3500 ft) & came on to Clarks ranch at 4500 ft, then over ridge at 7700 ft, and down to camp at 7500 ft. The camp is 3 or 4 miles south of Bair Lake. Made lists of plants & birds & mapped zones as I went.

Bluff Lake

Aug. 18. Sunday, Remained at camp writing up notes, coloring maps most of day & resting up from a very hard days climb yesterday. Had to walk most of the last half of trip — from 2700 to 7700 feet.

Aug. 19 - Trapped around camp.

Aug. 20. Started for San Gorgonio Peak and followed the Seven Oaks Trail to where it crosses the Santa Ana River at 5400 then up through Barton Flats to the head of the South Fork of Santa Ana and up a side canyon to Dry Lake at 9000 feet at north base of Grayback (San Gorgonio Peak). Did not reach our camp place till dark as we had some 20 miles to walk with considerable climbing. Young Roger S. Palmer went with me and took a horse to carry our blankets & grub & traps but there were no saddle horses available.

Up San Gorgonio Peak

Aug. 21. Left camp at 7 am & went up the north east slope of the mountain to the peak of 11,480 feet. Found a broad zone of Hudsonian with prostrate timber of mugho & flexilis pines and considerable area of Arctic Alpine on N.E. sloped peak with big permanent snow banks. A little scrubby growth goes to the summit on the south side. The Peak is soft light gray granite as are all the range. Great cirques cut into the NE slope in two places & glacial valleys extend below. with terminal & lateral moraines but not of very recent date. No meadows or moist places were seen above or near timberline and the plants were mostly of dry soil species. A few acres of Bryanthus grow over the north slope from 10,000-11,000 feet but it is scattered & does not make a complete carpet. There is no place or food for Phenacomys or Dicotonyx high up & neither were seen. Pine snow is abundant. The absence of Pikas & pine squirrels is conspicuous.

Aug. 22 Caught 6 Microtus m. breweri
+ 3 californicus + some other things -
Broke camp + walked back to
Bluff Lake, arriving at 4 P.M.
In evening gave a talk on Geographic
distribution to about 100 campers at
the Campfire.

Aug. 23 - Made up specimen nearly
all day, wrote up notes and filled
in grove map.